



Department of Commerce
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July 24, 2012

Energy Independence Act (EIA) **Advisory Opinion**

Nucor Steel Seattle, Inc.
Barton Kale
2424 SW Andover Street
Seattle, WA 98106

RE: Waste Heat Recovery Cogeneration Project Determination

Mr. Kale:

Commerce initiated the 90-day review for your project determination on June 14, 2012. Nucor's proposed waste heat recovery cogeneration project in Seattle, Washington received Energy Independence Act (EIA) Technical Working Group (TWG) guidance in November 2011; therefore your application was expedited. One comment in support of the project was received and posted online during the 30-day public comment period that closed on July 16. The Commerce Advisory Opinion committee met on July 17 to discuss your application and a draft opinion was forwarded to the agency's Attorney General for legal analysis.

Advisory Opinion

Based on committee discussion, prior TWG review, the Washington State University Extension Energy Program (WSU) engineering analysis, and consultation with the agency's Attorney General, Commerce confirms that the proposed project qualifies as high efficiency cogeneration.

Nucor submitted detailed data in their November 2011 request for TWG guidance. Nucor's Advisory Opinion application submitted for determination in June 2012 contains assurance that the proposed scope and design remain consistent with the one submitted in 2011. The proposal reviewed by this committee meets EIA requirements for qualification as a cogeneration project. Nucor will be responsible for demonstrating that the completed project meets the minimum efficiency and net generation requirements as demonstrated by the proposed design.

Relevant sections of the Energy Independence Act and WAC 194-37

RCW 19.285.040

Energy conservation and renewable energy targets

- (c) In meeting its conservation targets, a qualifying utility may count high-efficiency cogeneration owned and used by a retail electric customer to meet its own needs. High-efficiency cogeneration is the sequential production of electricity and useful thermal energy from a common fuel source, where, under normal operating conditions, the facility has a useful thermal energy output of no less than thirty-three percent of the total energy output. The reduction in load due to high-efficiency cogeneration shall be: (i) Calculated as the ratio of the fuel chargeable to power heat rate of the

cogeneration facility compared to the heat rate on a new and clean basis of a best-commercially available technology combined-cycle natural gas-fired combustion turbine; and (ii) counted towards meeting the biennial conservation target in the same manner as other conservation savings.

WAC 194-37-080.

- (10) “A utility may count towards the utility's biennial end-use conservation target, twelve individual months' worth of conservation during the first twelve months of a high efficiency cogeneration facility's operations in its service territory. The high efficiency cogeneration facility shall be owned and used by a retail electric consumer to meet that consumer's heat and power needs. Only that output used by that customer to meet its own needs can count toward the utility's conservation target. In order to count this in its conservation target, the utility shall prepare the following documentation, certified by a registered professional engineer licensed by the Washington department of licensing:
- (a) That the cogeneration system has a useful thermal energy output of no less than thirty-three percent of the total energy output; and
 - (b) An analysis that indicates the reduction in annual electricity consumption due to high efficiency cogeneration. This reduction is calculated as the net facility's annual electrical energy production times the ratio of the fuel chargeable to power heat rate of the cogeneration facility divided by the heat rate on a new and clean basis of a best-commercially available technology combined-cycle natural gas-fired combustion turbine.”

Analysis and Consultation

WSU's original engineering analysis and the TWG's subsequent review in 2011 reconfirmed that the proposed waste heat recovery project does qualify as high efficiency cogeneration under WAC 194-37-080. For the complete analysis refer to Engineering Analysis of Nucor Steel Waste Heat to Power Projects (WSU-EEP, September 2011). Technical information used in this analysis was obtained from the engineering report, Organic Rankine Cycle Waste Heat Recovery: Prefeasibility Study Report, Nucor Steel Seattle (Worley Parsons, 2009).

Based on application materials reviewed, the Assistant Attorney General (AAG) representing Commerce confirmed that this advisory opinion satisfies the requirements of Chapter 254, Laws of 2012 (SB 6414). The AAG also agrees with WSU's conclusion that the project described by Nucor apparently satisfies the statutory and regulatory requirements set forth in RCW 19.286.040 and WAC 194-37-080(10).

WAC 194-37-080 (10) (a) requires that the “cogeneration system has a useful thermal energy output of no less than thirty-three percent of the total energy output.” The total energy output for the Electric Arc Furnace is 49.9 MWt (megawatt thermal power) and the useful thermal energy output, calculated as the difference in energy entering and exiting the heat exchanger, is 18 MWt (49.9 minus 31.9 MWt). Therefore, the ratio of useful to total thermal energy output in this case is 35%, which meets the requirements of the WAC as a “high efficiency cogeneration system.” Similarly for the Reheat Furnace, the total energy output is 7.9 MWt and the useful thermal energy output is 2.8 MWt or 36% of the total, which also meets requirements.

WAC 194-37-080 (10) (b) requires calculation of the reduction in annual electricity consumption due to the high efficiency cogeneration. In the case of waste heat recovery cogeneration systems, the fuel chargeable to power heat rate is zero. Therefore, the reduction in annual electricity consumption is the net electricity

Glenn Atwood
SCL Waste Heat to Power Project ORD ATT 1
December 11, 2012
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generated or 2.5 MWe (megawatt electrical power) for the electric arc furnace Organic Rankine Cycle and 320 kWe for the reheat furnace Organic Rankine Cycle.

Commerce confirms that the proposed project qualifies as high efficiency cogeneration. If you have questions, please contact Meg O'Leary at meg.oleary@commerce.wa.gov or (360) 725-3121.

Thank you,



Tony Usibelli, Director, State Energy Office
WASHINGTON STATE DEPARTMENT OF COMMERCE